

AMENDMENTS TO THE CLAIMS

1. (currently amended) A method of continuously producing fiber reinforced elastomer components having length, depth and width and having fiber orientation at angles to the length direction of said component, the method comprising the sequential steps of
 - (a) extruding or injecting a fiber reinforced elastomer comprising elastomer and fibers,
 - (b) forcing said elastomer through a die (11) having a gate (12), whereby, if the due to the length l_2 of the gate is long enough, the length direction of fibers (20) will be oriented in the direction of the gate length l_2 when the elastomer leaves the gate (12);
 - (c) providing an expansion cavity (14) in said die (11) adjacent to said gate (12);
 - (d) controlling the viscosity of said elastomer such that the elastomer passes through said gate (12) as a ribbon (16) of elastomer;
 - (e) maintaining the orientation of the fibers in the ribbon (16) as it folds in the expansion cavity (14), the fibers ending up oriented in the direction of the height(h1) of expansion cavity (14), whereby the fibers (20) are substantially oriented perpendicular to the width W and parallel to the height h1 of the elastomer extrusion folded ribbon (1716) that forming the fiber reinforced elastomer component exits expansion cavity (14);
 - (f) collecting said component for storage or for direct use in an elastomeric product, characterized in that the gate (12) has a gap height h_2 larger than the average length of said fibers,
in that the viscosity of said elastomer as the elastomer enters the gate (12) is maintained at Mooney viscosity of 30 to 80, and
in that the elastomer is processed at a speed of 100 to 1000 mm/sec linear speed at the gate (12) and 1 to 100 mm/sec in the expansion cavity (14).
2. (currently amended) The method of claim 1 wherein an injection mold (50) is used for orienting fibers in an elastomer and further comprising the steps of
 - attaching the die (11) to said injection mold (50);
 - forcing the polymer fiber reinforced polymer through a sprue (18) using a ram (52);
 - collecting extrudate the component (17) having oriented fibers (20) therein on a collection roll (78).

3. (currently amended) The method of claim 2 comprising the step of
 - applying a scrim (72) to said ~~extrudate component~~ (17) as said ~~extrudate component~~ is collected.
4. (currently amended) The method of claim 2 comprising the steps of
 - applying a ~~ram~~ pressure of 10 to 30 thousand psi (69 to 207 MPa) on ~~polymer~~ (54) with ~~ram~~ (52);
 - applying a clamp force of 35 tons (256 kN) with a pneumatic arm (56) against the die (11).
5. (currently amended) The method of claim 4 comprising the steps of
 - selecting said die (11) such that the gate length l_2 is 0.75 inch to 1.25 inches (1,9 to 3,18 cm), the length l_1 of the expansion cavity is 0.60 inch to 1.25 inches (1,52 to 3,18 cm), the height h_1 of the expansion cavity is 0.01 inch (0,03 cm), the height h_2 of the gate is 0.14 inch (0,36 cm) and the gate width W is 5 inches (12,7 cm).
6. (currently amended) The method of claim 1 wherein an extruder (30) is used for orienting fibers in an elastomer, and the die (11) is partially formed from an expanding die, the die having a tapered runner leading into the gate (12), and further comprising the steps of
 - attaching the an expanding die (11a) having a tapered runner (22) to the end (31) of the extruder (30);
 - feeding an elastomer and fiber the fiber reinforced elastomer into the extruder (30) through an inlet (32);
 - mixing said elastomer in said extruder (30);
 - feeding the elastomer through an end (31) of the extruder (30) into the tapered runner (22) of the die (11a), and
 - collecting extrudate the fiber reinforced elastomer component (17a) from the die (11a).
7. (currently amended) The method of claim 6 comprising the steps of
 - maintaining the an extrusion pressure in said extruder (30) at 5000 psi (34 MPa), and
 - maintaining a clamping pressure on said die at 5000 psi (34 MPa).

8. (currently amended) The method of claim 1, 2 or 6 comprising the further step of providing the an expansion cavity (14) having-with a gap height h1 of 10 to 100 times the gap height h2 of said gate.

9. (currently amended) The method of claim 1, 2 or 6 comprising the further step of using a 1 to 6 phr Kevlar-aramid pulp as reinforcing fiber in said elastomer.

10. (original) The method of claim 1, 2 or 6 comprising the further step of forming a tire component with said die and the expansion cavity (14) has a length of 1.25 to 5.0 mm.

11 - 15. (canceled)

The above amendments are supported by the original specification.